

Appendix 2: Examples of Work-Related Asthma Cases Associated with Cleaning Products

California – Medical Receptionist/Records Clerk (new onset)

A woman in her 50's worked as a receptionist and medical records clerk in a medical clinic. She had no history of asthma and never smoked cigarettes. The clinic and its equipment were frequently wiped down using disinfectant wipes (alkyldimethylbenzylammonium chloride and dimethylethylbenzylammonium chloride). At times, the patient reported being on the phone while other people cleaned around her with disinfectant wipes for 1-2 hours straight. In addition, the patient shared receptionist duties with another worker, rotating into the reception area of the clinic. The other receptionist frequently wiped down the computer keyboard, desk and phones with disinfectant wipes.

One day, after the other receptionist used the wipes on surfaces and the patient moved to the reception area, she had a reaction involving burning eyes, wheezing, and coughing. She went back to an exam room in the clinic and was put on oxygen. They monitored her for an hour and only then thought to wash the chemical off her hands. She was sent to an occupational health clinic, where she was diagnosed with acute chemical bronchitis and treated with Zithromax. Two weeks later, she was still symptomatic and was referred to a pulmonologist, who performed pulmonary function testing that showed reversible reactive airways, and prescribed Advair 250/50 BID, Albuterol prn, and Prednisone 15 mg. Two months later, she experienced some improvement and returned to work, but was still symptomatic. Two days after returning to work, she was exposed again to the disinfectant wipes and experienced immediate chest tightness and coughing. Four months after her first symptoms, she was sent for pulmonary function testing prior to a follow-up pulmonology appointment. The technician wiped down the testing equipment with the same brand of disinfectant wipes, leading to the patient's immediate respiratory distress and she was transferred to the emergency room by ambulance. At that point, she was treated with Kenalog 40 mg IM. Over a six-month period, the other receptionist used the wipes on office surfaces repeatedly, in spite of being instructed not to use them there, and the patient's asthma symptoms continued to worsen. If the use of wipes was necessary elsewhere in the clinic, the patient was instructed to leave the building.

Two years later, she changed buildings, but it turned out that several steps from her desk was a small room where they cleaned instruments using the same quaternary ammonium compounds as in the previously used wipes. She went to the emergency room twice during this period, including once after a large cleaning and disinfecting job was done in the waiting room. She stopped work three years after her initial incident due to medical advice. She still has dyspnea upon exertion and persistent and recurrent asthma. Many different chemicals now bother her and she reports it has greatly affected her life. She feels she lost her job and many friends because of her work-related exposures.

Massachusetts – Hospital Housekeeper (work-aggravated)

A woman in her 20's worked in housekeeping at a large urban medical complex. She had been diagnosed with asthma prior to starting this job. Within a year of starting work, her asthma was aggravated resulting in an emergency department visit and four days out of work. Her asthma symptoms were triggered after she began to use Perisept, a new sporicidal high-level disinfectant to clean patient rooms, especially after patients were discharged, and rooms were cleaned "top-to-bottom." She reported that other employees, as well as patients had been having problems with this product. She began smoking cigarettes as a teenager, three to four cigarettes per day.

This employee's asthma was one of four case reports to the Massachusetts Department of Public Health (MDPH) related to a change from bleach to the new disinfectant. The cluster of cases led to a meeting between MDPH and representatives from various departments in this hospital complex: infection control, employee health, environmental health and safety, housekeeping, regulatory compliance and hospital epidemiology.

The hospital had previously used bleach but because of respiratory problems among staff and corrosion of equipment had switched to Perisept. Hospital epidemiology and infection control sought an alternative disinfectant that would be effective against *Clostridium difficile*, a leading cause of serious healthcare associated infections, reported daily in this complex. Perisept contained hydrogen peroxide, peracetic acid and acetic acid, and has been designated a known sensitizing asthmagen by the Association of Occupational and Environmental Clinics (AOEC). Other healthcare workers have reported asthma and other respiratory problems related to the same ingredients, which were identified in a product called Oxycide.

Efforts had been made to reduce exposure to the disinfectant by isolating the area where it was diluted from bulk containers and preparing closed containers with dampened cloths with the disinfectant. Employees with underlying respiratory health problems tended to have the most work-related symptoms. They were transferred to other tasks. After the meeting, further steps were recommended to reduce exposure to the disinfectant by limiting its use to surfaces that require high-level disinfection. These might include noncritical environmental touch surfaces where body fluids or infectious agents are observed or suspected, and rooms in which a patient with *C diff* had been located. Use on floors or walls or windows was discouraged.

Michigan – Office Cleaner (new-onset)

A man in his thirties, who worked for a building services company that cleaned schools, developed wheezing, cough, chest tightness and shortness of breath shortly after beginning to work with a spray cleaner. His symptoms were worse after cleaning in enclosed spaces and the pool area. He was prescribed an inhaled steroid twice a day and began taking a bronchodilator one to three times a day. He sought care in the emergency department for respiratory symptoms five times over the year after the onset of his symptoms. A year after his symptoms began, he was still working and continued to be symptomatic. He had never smoked cigarettes and had no

personal or family history of allergies or asthma. Spirometry, lung volumes and diffusing capacity were normal.

The cleaning service was cited by OSHA because their employer used cleaners containing phosphoric acid and had no access to an eyewash facility, no protective goggles, and no training for handling corrosive substances.

New Jersey - Hotel Housekeeper (Reactive Airways Dysfunction Syndrome)

An Hispanic woman in her 30's, who worked as a housekeeper at a hotel, experienced coughing and shortness of breath while spraying and mopping the bathroom floor with a hydrochloric acid product. She had been told by her employer to dilute the product with water and clean the floor, but was not given any specific instructions on using the product safely. Two days later, the housekeeper presented to her primary care physician with worsening symptoms, including dyspnea on exertion and intermittent wheezing. She was diagnosed with work-related asthma, and prescribed Prednisone and Symbicort. The patient smoked six cigarettes a day. She had no previous history of asthma. She was referred to an Occupational Health Clinic for medical testing. A chest radiograph showed no evidence of pulmonary infiltrate or mass, and no pleural effusion. Spirometry showed mild obstruction. The patient was advised not to return to work and abstain from smoking and was referred to a Pulmonologist.

Three days later, she presented to the Occupational Health Clinic again after experiencing similar symptoms. Based on the test results and the Pulmonologist's consultation, the Clinic doctor's assessment was Reactive Airway Disease secondary to exposure to fumes at work. The Pulmonologist also indicated possible COPD. The patient was advised to complete the prescribed Prednisone and return for a follow-up visit in a week. At this visit, she presented with chest tightness and was prescribed a Xopenex inhaler and Advair. Two weeks later, during the final follow-up visit, she was asymptomatic and was advised she could return to work in a few days. The New Jersey Department of Health, Occupational Health Surveillance Unit, sent fact sheets on the primary component, Hydrochloric Acid, along with educational materials on asthma and cleaning agents to the employee.

New York – Retail (work-aggravated)

A woman in her 40's experienced shortness of breath and wheezing while working at a discount department store. She was a non-cigarette smoker with a history of asthma that continued since childhood. As part of her work duties, she performed cleaning tasks in her assigned section of the store. On the day of the incident, she was asked to clean the shelves with an un-marked spray bottle previously filled by someone else. While using the cleaner she immediately noticed a strong smell and shortly after she began to wheeze and experience shortness of breath. It was later determined that the ammonia containing cleaning product had not been properly diluted and was placed in the bottle fully concentrated. She sought medical treatment and was prescribed Prednisone and Atrovent. She returned to work two days later and experienced another episode

of shortness of breath and wheezing. She was transported via ambulance to the local hospital where she was treated for an asthma attack and then sent home. When interviewed a few years later, she described her asthma as more severe and that she needed to take more medication for her breathing problems than prior to the incident. She no longer worked for the department store. To accommodate her asthma, in her new job as a shift supervisor at a coffee baked goods shop she was reassigned to an area away from an area when it was cleaned.